REMARKS

Claims 1-23 are pending. Claims 1-8 have been amended and new claims 9-23 have been added to recite additional features of Applicant's invention.

Reconsideration of the application is respectfully requested for the following reasons.

In the Office Action, the Examiner rejected claims1-8 under 35 U.S.C. §103(a) for being obvious in view of a combination formed between the Caldwell and Gruodis patents. Applicant traverses this rejection for the following reasons.

Claim 1 recites a glass touch sensing circuit, comprising a touch sensor, a switch, a compensator, and a touch detector. The touch sensor provides an output signal in response to a user's touch. The switch has a switching period of time differently determined depending on a level of the output signal from said touch sensor. The compensator compensates for a variation in a level of a reference signal for a variation in temperature, compares a level of an output signal from said switch with that of the compensated reference signal, and outputs a wave-shaped signal in accordance with a compared result. And, the touch detector is responsive to an output signal from said compensator for detecting whether the user touches said touch sensor.

In order to establish a *prima facie* case of obviousness for claim 1, two requirements must be satisfied. First, the cited references must teach or suggest all the features in claim 1. Second, there must have been some teaching or suggestion in existence at the time the claimed invention was made that would have led one of ordinary skill in the art to combine the references in an

attempt to form the invention. See MPEP §2143.01 and *In re Rouffet*, 47 USPQ.2d 1459 (Fed. Cir. 1997).

The Caldwell patent discloses a control circuit for a touch pad. The control circuit includes a comparator which compares a signal input from a touch sensor with a reference signal, and then outputs a touch detection signal based on the comparator output. The Caldwell control circuit further includes a potentiometer which allows a user to manually control the level of the reference signal.

Claim 1 is different from the Caldwell patent in at least the following respects.

First, claim 1 recites a compensator which compensates for a variation in a level of a reference signal for a variation in temperature. The Caldwell patent does not teach or suggest these features. More specifically, the Caldwell patent discloses a potentiometer for varying the level of a reference signal, but neither that potentiometer nor any other element of the Caldwell system varies that level to compensate for variations in temperature.

Second, claim 1 recites that the compensator compares a level of an output signal from the switch with that of the compensated reference signal. The Caldwell system also does not teach or suggest this feature. More specifically, the Caldwell patent does not teach or suggest generating a temperature-compensated reference signal. It therefore logically follows that Caldwell also does not teach or suggest comparing a temperature-compensated reference signal to an output signal of a switch.

Third, claim 1 recites that the compensator outputs a wave-shaped signal in accordance with a compared result. Since the Caldwell system does not perform the comparison of the

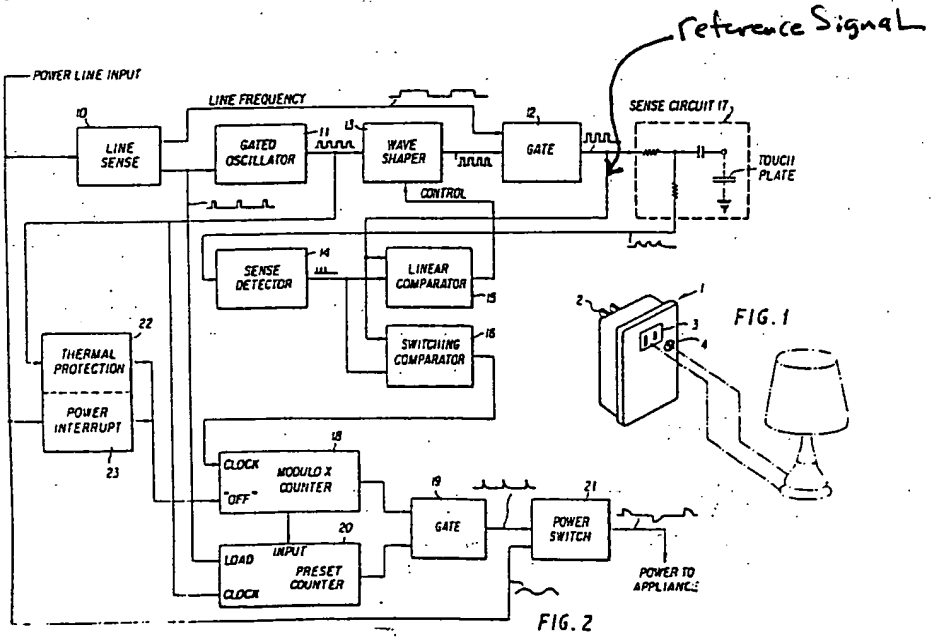
claimed invention, it follows that Caldwell also does not output a wave-shaped signal based on a result of such a comparison.

Based on at least the foregoing differences, it is respectfully submitted that the Caldwell patent cannot render claim 1 obvious. In order to make up for the deficiencies of the Caldwell patent, the Gruodis patent was cited.

The Gruodis patent discloses a lamp with a touch-control circuit. In operation, a signal from a touch sensor is compared with a reference signal in a comparator. The lamp is then switched on or off based on an output of the comparator.

Claim 1 is different from the Gruodis patent in the same way in which it is different from Caldwell. First, claim 1 recites a compensator which compensates for a variation in a level of a reference signal for a variation in temperature. The Gruodis patent does not teach or suggest a compensation circuit of this type. To understand this difference, Applicant has reproduced Fig. 2 of the Gruodis patent below.

Protection Circuit 22 does NOT Control The reference Signal At All, let alone do So based on Temperature Variation



As shown in Fig. 2, the Gruodis control circuit operates by first receiving a signal from a sense circuit 17 of a touch plate. This signal is then input into a sense detector 14, which produces a pulse signal proportional to the touch plate signal. The pulse signal is input into two comparator circuits, which compare the signal to a reference signal output gate 12. The output of gate 12 is derived from an input power line. The comparators output values which are ultimately used to control the lamp.

In addition to these features, the Gruodis control circuit includes a thermal protection unit 22. As the Examiner will note, this thermal protection unit is not located in the signal path used to process the touch plate signal, but rather only comes into play after the touch plate signal has been fully processed. Operation of the thermal protection unit may be found at column 5 of the Gruodis patent:

> Thermal protection unit 22 is a safety circuit which prevents thermal runaway if the current draw of the load becomes larger than the rating power of switch 21. It is a low pass filter driven by gated oscillator 11. At room temperature, the circuit blocks the oscillator output, but at elevated temperatures, a capacitor with a large negative temperature coefficient allows the signal from the oscillator to pass. This signal drives the modulo X counter to the "off" state. (Emphasis added)(Column 5, Lines 33-42).

From the above text, it is clear that the thermal protection unit of Gruodis operates basically as a fuse. If the current draw from the load becomes too high, it switches power switch off to prevent the touch plate control signal from operating the lamp. Conversely, if the current

draw is below a certain threshold level, the thermal protection circuit does not come into play and the touch plate control signal is allowed to pass to control the operation of the lamp.

From the above text and Fig. 2 (reproduced above), it is further clear that the thermal protection unit of Gruodis does not in any way control a level of the reference signal output from gate 12, which is compared with a signal from the touch plate in order to generate a control signal for operating the lamp. Instead, the reference signal input into the comparators is controlled by sense detector circuit 14, which does not take temperature variation into consideration when modifying the output of sense circuit 17.

Because the thermal protection circuit of Gruodis does not control a level of its reference signal, it is respectfully submitted that a correspondence between the thermal circuit protection circuit of Gruodis and the compensator of claim 1 cannot be properly drawn, i.e., the Gruodis thermal protection unit does not perform the recited function of: compensating for a variation in a level of a reference signal for a variation in temperature.

Second, claim 1 recites that the compensator compares a level of an output signal from the switch with that of the compensated reference signal. Gruodis does not generate the recited compensated reference signal. It therefore logically follows that the control circuit of Gruodis does not perform this function of the invention.

Third, claim 1 recites that the compensator outputs a wave-shaped signal in accordance with a compared result. Gruodis does not perform the comparison function recited in claim 1. It therefore respectfully submits that Gruodis also does not output a wave-shaped signal based on a result of such a comparison.

From the foregoing discussion, it is clear that the Gruodis patent does not teach or suggest the compensator of claim 1. It therefore follows that any combination formed between Gruodis and Caldwell will also lack such a feature. For at least these reasons, it is respectfully submitted that claim 1 and its dependent claims are patentably distinguishable from a Caldwell-Gruodis combination.

New claims 9-23 have been added to the application.

Claim 9 recites that the flip-flop recited in claim 5 is a D flip-flop. None of these features are taught or suggested by the references of record, whether taken alone or in combination.

Claim 10 recites a touch sensing system comprising: an input terminal for receiving a signal output from a touch sensor, and a controller which processes the signal from the touch sensor based on a variation in temperature to generate a touch detection signal. None of these features are taught or suggested by the references of record, whether taken alone or in combination.

Claim 11 recites that the controller processes the signal from the touch sensor in a manner which achieves a constant level of touch detection sensitivity in spite of temperature variation. None of these features are taught or suggested by the references of record, whether taken alone or in combination.

Claim 12 recites that the controller includes a switch which outputs a switch signal based on the signal from the touch sensor, and a compensator which compensates for variations in the switch signal based on temperature variation.

Claim 13 recites that the controller includes a switch which outputs a switch signal based on the signal from the touch sensor, a signal generator which generates a reference signal, and a comparator which compares the switch signal to the reference signal. Claim 13 also recites that the controller generates the touch detection signal based on an output of the comparator. None of these features are taught or suggested by the references of record, whether taken alone or in combination.

Claim 14 recites that the signal generator includes a level-controller which controls a level of the reference signal based on temperature variation. None of these features are taught or suggested by the references of record, whether taken alone or in combination.

Claim 15 recites that the level-controller varies the level of the reference signal to coincide with changes in the switch signal that result from variation in temperature. None of these features are taught or suggested by the references of record, whether taken alone or in combination.

Claim 16 recites that the level-controller decreases the level of the reference signal to a first non-zero value as temperature increases, and increases the level of the reference signal to a second non-zero value as temperature decreases. None of these features are taught or suggested by the references of record, whether taken alone or in combination.

Claim 17 recites that the level-controller includes a thermistor which output a voltage value that varies the level of the reference value based on temperature variation.

Claim 18 recites a touch sensing system which includes a switch which outputs a switch signal based on a touch sensor signal, and a controller which compensates for variations in a

turning-on period of the switch in order to generate a touch detection signal. None of these features are taught or suggested by the references of record, whether taken alone or in combination.

Claim 19 recites that the controller compensates for variations in falling edge depth of the switch signal output from the switch. None of these features are taught or suggested by the references of record, whether taken alone or in combination.

Claim 20 recites that the controller includes a comparator for comparing the switch signal to a reference signal to generate a compensated switch signal, wherein the controller generates the touch detection signal based on the compensated switch signal. None of these features are taught or suggested by the references of record, whether taken alone or in combination.

Claim 21 recites that the controller includes a compensator which varies the reference signal based on temperature variations. None of these features are taught or suggested by the references of record, whether taken alone or in combination.

Claim 22 recites that the compensator includes a thermistor which outputs a value for varying the reference signal based on temperature variations. None of these features are taught or suggested by the references of record, whether taken alone or in combination.

Claim 23 recites that the controller includes a flip-flop circuit having an input connected to the output of the comparator and an output for supplying the touch detection signal, wherein the compensated switch signal is input into a clock terminal of the flip-flop. None of these features are taught or suggested by the references of record, whether taken alone or in combination.

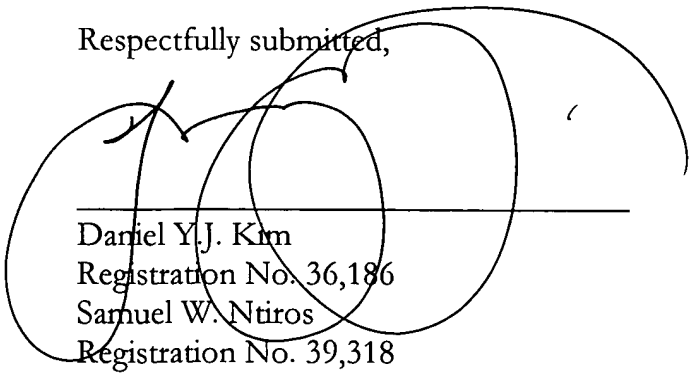
Reconsideration and withdrawal of all the rejections and objections made by the Examiner is hereby respectfully requested.

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and prompt allowance of the application is respectfully requested.

Should the Examiner believe that further amendments are necessary to place the application in condition for allowance, or if the Examiner believes that a personal interview would be advantageous in order to more expeditiously resolve any remaining issues, the Examiner is invited to contact Applicants' undersigned attorney, **Samuel W. Ntiros,** at the telephone number listed below.

To the extent necessary, Applicants petition for an extension of time under 37 C.F.R. §1.136. Please charge any shortage in fees due in connection with this application, including extension of time fees, to Deposit Account No. 16-0607 (Attorney Docket No. IK-011) and credit any excess fees to the same Deposit Account.

Respectfully submitted,



Daniel Y.J. Kim
Registration No. 36,186
Samuel W. Ntiros
Registration No. 39,318

FLESHNER & KIM, LLP
P.O. Box 221200
Chantilly, VA 20153-1200
Telephone No: (703) 502-9440
Facsimile No: (703) 502-9596
Date: November 18, 2002

Marked-Up Version of the Amended Claims

1. (Amended) A glass touch sensing circuit, comprising:

a touch sensor which provides an [for providing its] output signal in response to a user's touch;

a switch [switching means] having a switching period of time differently determined depending on a [the] level of the output signal from said touch sensor;

a compensator which compensates for a variation in a [comparison means for compensating the] level of a reference signal for a variation in temperature, compares a [comparing the] level of an output signal from said switch [switching means] with that of the compensated reference signal, and outputs [outputting] a wave-shaped signal in accordance with a [the] compared result; and

a touch detector [detection means] responsive to an output signal from said compensator [comparison means] for detecting whether the user touches said touch sensor.

2. (Amended) A glass touch sensing circuit as set forth in Claim 1, further comprising:

a charging/discharging unit which charges and discharges [means for charging and discharging] a voltage which is different in level according to whether the user touches said touch panel, said switching time period of said switch determined [switching means being] depending on a [the] level of said voltage [being] charged and discharged by said charging/discharging unit [and discharging means].

3. (Amended) A glass touch sensing circuit as set forth in Claim 1, wherein said touch detector [detection means] includes:

a signal output unit which provides an [means for providing its] output signal synchronously with said output signal from said compensator [comparison means]; and

a recognition unit which recognizes [means for recognizing] a touched key in response to the output signal from said signal output unit [means].

4. (Amended) A glass touch sensing circuit as set forth in Claim 3, wherein said recognition unit recognizes an [means is adapted to recognize the] input of said touched key and initializes [initialize] said signal output unit [means].

5. (Amended) A glass touch sensing circuit as set forth in Claim 1, wherein said touch detector [detection means] includes:

a [D] flip-flop having a clock terminal connected to an output terminal of said compensator [comparison means], said [D] flip-flop being enabled in response to a clock signal [being] applied to said clock terminal; and

a processor [microprocessor] having an input terminal connected to an output terminal of said [D] flip-flop, said processor [microprocessor] recognizing the user's touch with said touch sensor in response to an output signal from said [D] flip-flop and initializing said [D] flip-flop.

6. (Amended) A glass touch sensing circuit as set forth in Claim 1, wherein said compensator [comparison means] includes a thermistor which compensates for [compensating] the level of said reference signal for the temperature variation.

7. (Amended) A glass touch sensing circuit as set forth in Claim 6, wherein said compensator [comparison means] further includes:

a comparator having a first input terminal connected to an output terminal of said switch [switching means], and a second input terminal for inputting a voltage determined in level by said thermistor and fixed resistors.

8. (Amended) A glass touch sensing circuit as set forth in Claim 1, wherein said switch [switching means] includes a transistor which turns [turned] on in response to said output signal from said touch sensor.